NORTH FORK JOHN DAY RIVER BASIN ANADROMOUS FISH HABITAT ENHANCEMENT PROJECT Annual Report for February 2017 – January 2018

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Project No. 2000-031-00
Contract Number 73982

January 2019

ABSTRACT

The Confederated Tribes of the Umatilla Indian Reservation's North Fork John Day Anadromous Fish Enhancement Project continued to develop and implement habitat improvements during 2017 using guidance from the Umatilla River Vision, 2008 Accords, John Day Subbasin Plan, Mid-Columbia Steelhead Recovery plan, and other plans and management documents. Cooperative efforts between private landowners and public entities such as the North Fork John Day Watershed Council, Umatilla National Forest, and Wallowa-Whitman National Forest prioritized, designed, and implemented specific habitat restoration efforts. During 2017 the project worked to complete the Desolation Creek Geomorphic Assessment and Action Plan, develop designs for the highest priority identified through the Desolation Creek Assessment and Action Plan, complete a restoration design on Granite Creek, collect and analyze eDNA data, establish a gauging station on Desolation Creek, maintain conservation agreements, develop new restoration projects, and coordinate with collaborators. Three proposed actions, the Bull Run Creek design, Desolation Creek's Lower Reach 6 design, and Desolation Creek's meadow storage study were not completed by the end of the performance period. Noxious weeds were controlled and monitoring data collected on sites where Riparian Conservation Agreements exist or where the CTUIR's Bio-Monitoring Project (BPA Project #2009-014-00) established monitoring sites.

ACKNOWLEDGMENTS

The Confederated Tribes of the Umatilla Indian Reservation wish to thank the Bonneville Power Administration for funding the project and its personnel Jessie Wilson, Jenna Peterson, Sean Welch, Israel Duran, and others for their assistance. We would also like to give thanks to the North Fork John Day Watershed Council and staff for providing a forum for tribal input and promoting the Confederated Tribes of the Umatilla Indian Reservation's habitat recovery efforts; the Umatilla National Forest and its employees (Fishery Biologists Kathy Ramsey and Hugo Magana, Hydrologist Richard Cissel, Range Manager Brad Lathrop) and the Wallowa Whitman National Forest and its employees (Engineer Brett Yaw, Biological Science Technician Ray Lovisone, Fish Biologist Joe Vacirca) for assistance with cooperative restoration efforts and providing information, and Oregon Department of Fish and Wildlife's Ian Tattum, Brent Smith, Trevor Watson, Mike Jensen, Russell Powell, and Josh McCormick. Thanks also to Confederated Tribes of the Umatilla Indian Reservation staff, whose cooperation and contributions are evident in this report. Special thanks to Delbert Jones in assisting with monitoring efforts and implementing and maintaining improvements, to Julie Burke, Celeste Reeves, and Michelle Thompson for administrative support, and Gary James and Mike Lambert for support and guidance. We would like to acknowledge cooperating landowners, Ecotrust Forest Management, Steve Berry, Brian Prater, Robin, Mary Lou, Andy and Bill Fletcher, Rose Pedracinni, and Lois Hartley Cannady who supported our efforts through conservation agreements.

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INTRODUCTION

Funding approved in 2000 by the Bonneville Power Administration charged the Confederated Tribes of the Umatilla Indian Reservation's North Fork John Day River Habitat project (The Project) with enhancing terrestrial and aquatic habitat. While the tools and strategies have evolved over time restoration has and will continue to be implemented through direct action or modifying land management strategies in the North Fork John Day (NFJD) basin (Figure 1).

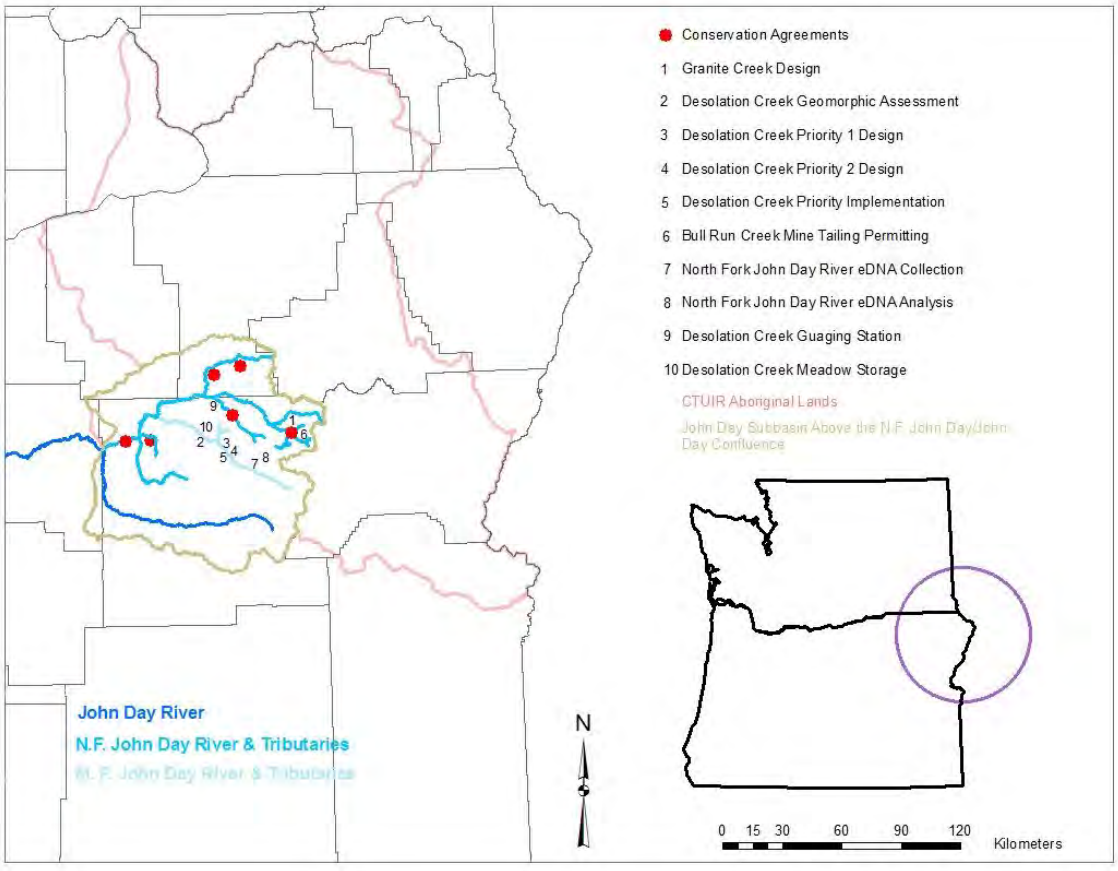


Figure 1. Map of the CTUIR ceded lands and focus basins for The Project.

Since 2000 subasin plans and recovery documents have been used as a basis for establishing The Project's strategy as they became available. However, the development of the Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) First Foods (Figure 2) has more recently formed the basis for all of The Project's efforts. The First Foods are integral to native culture and religion and their perpetuation in effect provides for the continuation of CTUIR's society. In other words, they constitute the minimum ecological products necessary to sustain the CTUIR's culture. The mechanism by which the First Foods management or enhancement occurs within the CTUIR's Department of Natural Resources was published developed in 2008 as the Umatilla River Vision (Jones, 2008). The strategy identified a holistic process driven approach enveloping five touchstones (hydrology, connectivity, geomorphology, aquatic biota, and riparian vegetation).

Figure 2. Characterization of the First Foods by grouping and cultural significance with respect to men's and women's foods. First Foods are listed in order of importance from left to right.

Since 2000 The Project has focused upon improving habitat for aquatic species on private lands and to that end early restoration actions were passive in nature and occurred as opportunities arose and typically included removing grazing cattle from sensitive stream channel and riparian habitats. These early efforts were in part hampered by the public's unfamiliarity with the CTUIR or habitat restoration in general which changed through educational and outreach efforts. Thus far The Project has implemented a variety of actions (Appendix 1) influencing 754 stream kilometers and 8085 acres through a mix of riparian fencing construction and maintenance, stock water development, passage barrier removal, native plantings, mine effluent efficiency improvements, and stream channel improvement efforts as well as several surveys and assessments. During 2017 we continued implementing measures to protect sensitive riparian, floodplain, and wetland habitats, continued design efforts, and made progress in strategic planning through the development of assessments. The cumulative effect of these actions are expected increase juvenile and adult freshwater survival resulting in greater numbers of Endangered Species Act listed Mid-Columbia River Summer Steelhead trout (*Oncorhynchus mykiss*) and Bull trout (*Salvelinus confluentus*) in addition to Spring Chinook salmon (*Oncorhynchus tshawytscha*) and redband trout (*Oncorhynchus mykiss gairdnerii)*.

The Project originally focused its efforts upon working with private landowners. However, this has proven to be difficult for a variety of reasons and as such we're also cooperating with public land management agencies. This approach was accepted by the Independent Scientific Review Panel (ISRP) during their 2006 Geographic Review process, the proposal for which, identified four 5th field HUCS (#1707020206, #1707020205, #1707020202, and #1707020204) in three tributaries to the North Fork John Day River including upper and lower Camas, Granite, and Desolation Creeks as focus basins (Figure 1). The designations were based upon restoration and protection potentials contained within the John Day Subbasin Plan and other guidance documents. For the 2013 ISRP Geographic Review these same focus basins were again

submitted as priority areas for restoration with the intent to implement as many as possible by the end of 2018 using guidance not limited to the 2005 John Day Subbasin Plan (NPPC, 2005), 2008 Mid-Columbia Steelhead Recovery Plan (NMFS, 2008), 2002 Bull Trout Recovery Plan (USFWS, 2002), and CTUIR's adoption of the First Foods policy and Umatilla River Vision (Jones, 2008). Throughout this period BPA sponsors within the John Day River Basin began communicating more effectively and The Project began working closely with cooperators such as the Umatilla and Wallowa-Whitman National Forests (UNF and WWNF respectively) and the North Fork John Day Watershed Council (NFJDWC). The Project also adopted different restoration action criteria and strategies to undertake reach scale or larger efforts which were presented in the Project's 2013 ISRP Geographic Review Proposal. Under this strategy the three focus basins remain although the approach to restoration reflects the qualities of each basin.

Within Granite Creek focus area the Granite Creek Action Plan (USFS, 2008) developed by the Umatilla National Forest (UNF) and the Bull Run Creek Action Plan (USFS, 2012) developed by the Wallowa-Whitman National Forest (WWNF) form the basis for cooperative restoration actions on public lands. The Project has attempted to work on private lands with limited success but will, where possible, implement restoration actions adjacent to treated USFS properties with the intent of extending and connecting treated reaches further downstream.

Within Desolation Creek basin The Project, with the assistance of collaborators developed a basin wide action plan by incorporating prioritized actions on private and public lands into a single scientifically defensible strategy for restoration. This action plan will form the basis and justification for restoration actions in the desolation Creek basin.

Within Upper and Lower Camas Creek basins The Project has been coordinating with the UNF and WWNF in the basin's headwater areas and with private landowners in the balance of the basin. The Project funded a geomorphic assessment which established a strategy for addressing sediment deposition in Ukiah, Oregon. Although not a comprehensive action plan for the entire basin it outlines typical treatments which will address ecological concerns moving forward throughout the basin. This does not preclude The Project's participation in any future effort to develop a Camas Creek basin wide action plan using Bonneville Power Administration's (BPA) ATLAS or equivalent framework should public and private priorities and sentiment support such an action.

Appendix I show sites where maintenance or restoration efforts have been completed since the Projects inception on private and public lands. On private lands the CTUIR has entered into conservation agreements with private landowners. Cooperative partners with whom CTUIR hasn't entered into a Riparian Conservation Agreement have included the North Fork John Day Watershed Council (NFJDWC), the Umatilla National Forest (UNF), WWNF, Grant Soil and Water Conservation District, National Resource Conservation Service (NRCS), and the Farm Services Agency (FSA) among others. Conversations with these and other groups or agencies are proving useful for identifying additional restoration opportunities and dispersing information regarding the benefits of cooperative restoration efforts to develop trust with small rural communities within the NFJD Basin. For example, the NFJDWC has proven invaluable for reaching out to the 1,200 people residing within the basin that may otherwise be reluctant to cooperate with a tribal or government entity.

BPA initially approved the Project in 2000 with on-the-ground actions following in 2001 to

provide partial mitigation for the loss of native salmon and steelhead resulting from the construction of dams on the Columbia River. Additional habitat restoration funds are secured through entities such as the Farm Service Agency, Natural Resource Conservation Service, Oregon Watershed Enhancement Board, Oregon Department of Fish and Wildlife (ODFW), U.S. Bureau of Reclamation (BOR), the U.S. Army Corps of Engineer (Corps) and other private or public. In an effort to reduce costs associated with overhead the UNF's North Fork John Day Ranger District provides office and storage space while vehicles and equipment are shared with:

(1) BPA Project #198710001 – CTUIR's Umatilla River Basin Anadromous Fish Habitat Enhancement Project
(2) BPA Project #199604601 – CTUIR's Walla Walla Basin Habitat Enhancement Project
(3) BPA Project #199608300 – CTUIR's Grande Ronde Basin Habitat Enhancement Project
(4) BPA Project #200820100 – CTUIR's Protect and Restore the Tucannon Watershed

This annual report covers efforts conducted from 1 February 2017 through 31 January 2018.

SITE DESCRIPTION

The NFJD River (Figure 3) basin is the largest tributary to the John Day River flowing westerly for 180 kilometers to join the mainstem John Day River near Kimberly, Oregon. The NFJD River's basin covers 47,885 square kilometers consisting of 37% private, 62% federal, and 1% state lands. The NFJD has been designated as a Wild and Scenic River from Camas Creek upstream to the head waters including one portion classified as "Wild," two as "Scenic," and two as "Recreational." These segments are primarily managed by the UNF and WWNF. State Scenic Waterways designated by the State of Oregon, stretch from Monument, OR upstream to the NFJD Wilderness boundary and from the confluence with the North Fork John Day River upstream to the Crawford Creek Bridge on the Middle Fork John Day River. The Middle Fork John Day River (MFJD) (Figure I) flowing into the NFJD is generally considered and primarily managed as a separate system by ODFW, the Confederated Tribes of the Warm Springs Reservation of Oregon, and The Nature Conservancy. The NFJD contains fifteen 5th Field HUC's (Figure 3) of which four, the Upper and Lower Camas Creek, Desolation Creek, and Granite Creek units are considered 'priority' areas for the purpose of concentrating the Project's restoration efforts.

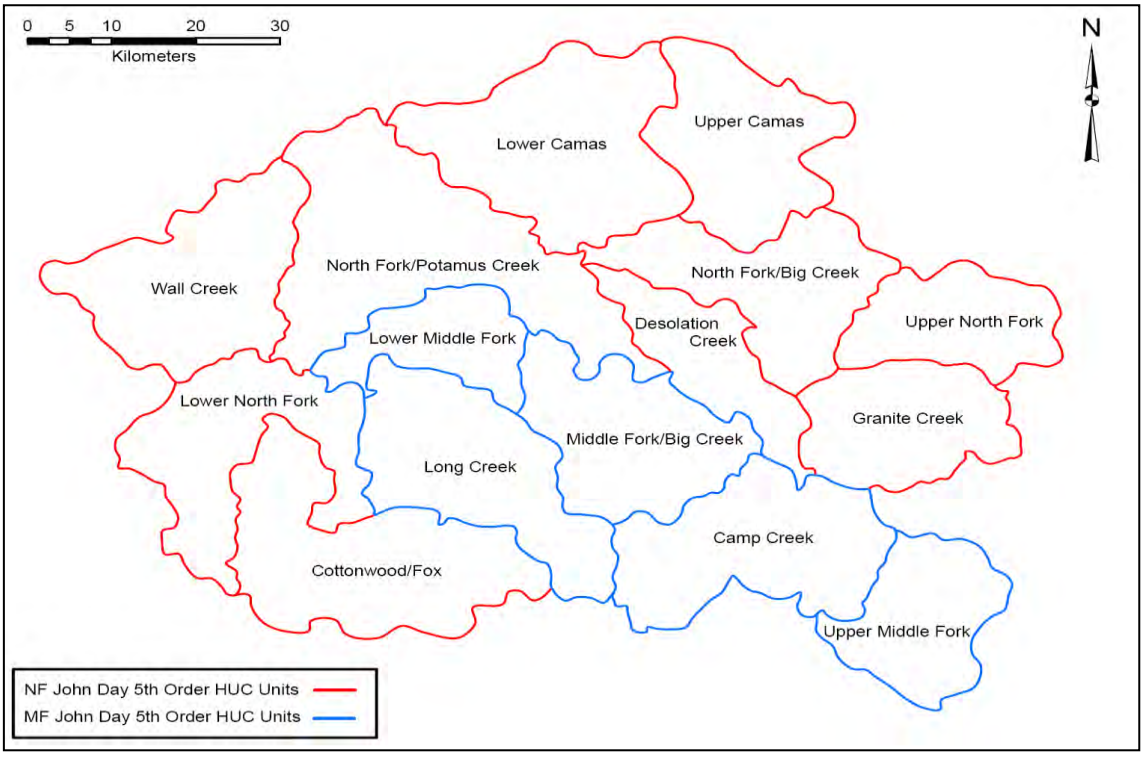


Figure 3. NFJD 5th field HUC's

Diverse land forms and geology range from 558 meters at the mouth to 2,530 meters in elevation in the headwaters and consist of Columbia River Basalts, oceanic crust, volcanic materials, historic river and lake deposits, and recent river and landslide deposits. The North Fork John Day basin has a continental climate influenced by maritime weather patterns in the higher elevation areas which are characterized by low winter and high summer temperatures, low to moderate average annual precipitation and dry summers. Climate ranges from sub-humid in the upper elevations to semi-arid in the lower elevations with 0.33 to 0.5 meters annually

contributing 60% of the flow in the lower John Day River, primarily through November and March. Mean annual temperatures are 3° C in the upper sub-basin and 14° C in the lower sub-basin and range from less than -18° C in the winter to over 38° C during the summer. The average frost-free period is 50 days in the upper sub-basin and 200 days in the lower sub-basin. The Blue Mountains in the basin's higher elevations produce a range of microclimates unlike the lower basins typical warmer and more stable patterns.

Historically, the John Day River was one of the most significant anadromous fish producers in the Columbia River Basin (CRITFC, 1995) due to its stability, strong summer stream flows, high water quality, and heavy riparian cover. Riparian areas were densely populated with aspen, poplar, willow, and cottonwood and beaver were abundant. Large spring and fall Chinook salmon migrations and numerous beaver sightings indicated the John Day River contained extensive in-stream habitat diversity. Resident trout species including westslope cutthroat (*Oncorhynchus clarki lewisi*), interior redband and bull trout gave way as habitat changed in response to land management objectives. These changes favored introduced species such as brook trout (*Salvelinus fontinalis*), smallmouth bass (*Micropterus dolomieui*), and redside shiner (*Richardsonius balteatus*) in places historically dominated by native resident salmonids. The NFJD currently supports strong native runs of spring Chinook salmon and summer steelhead in the Columbia River Basin with minimal influence from hatchery stocks. Narum et al. 2008 confirmed the John Day River's status as a viable refuge for wild stocks with limited anthropogenic influence.

Historic and current land use practices or threats (Table I) within the have reduced river stability, decreased high quality summer stream flows and water quality, reduced heavy riparian and floodplain cover, and compromised physical and biological processes related to these associations and structures. The loss of abundant riparian and flood plain vegetation, once robust beaver populations, and large spring and fall Chinook salmon migrations suggest the NFJD has lost a significant amount of in-stream habitat diversity and may now have an altered hydrologic cycle. Changes in the hydrologic cycle attributed to altered riparian and floodplain areas and stream morphology and processes can be indicated by increased runoff, altered peak flow regimes, reduced ground water recharge and soil moisture storage, and low late-season flow and elevated water temperatures. Historic and current land management strategies, in combination with possible changes in the hydrologic cycle, have contributed to stream channel instability (i.e., channel widening and downcutting) in some portions of the NFJD. Additionally, wildlife habitat has become increasingly fragmented, simplified in structure, and infringed upon or dominated by non-native plants (ICBEMP, 2000).

Major Limiting Factors	**Threats**
Floodplain & Channel Structure In-Stream Habitat Sediment Routing Water quality	Riparian Disturbance Stream Channelization & Relocation Grazing Forest practices Roads Irrigation Withdrawals Mining & Dredging

Table I. Limiting factors and threats within the North Fork John Day Basin.

Limiting habitat factors identified in the NFJD basin (Table 1) and designated in Carmichael (2006), Columbia BM RC&DA (2005), and various management plans include water quality (temperature, modified flows, nutrient input), in-stream habitat (structure, cover, sediment loading, channel morphology and processes,), and riparian health. Most streams in the NFJD basin are considered to be in relatively good condition, with the exception of elevated late summer water temperatures that exceed Oregon Department of Environmental Quality standards. In general, most indicators of channel condition within the NFJD suggest the basin is "functioning at risk".

Primary limiting factors identified in the 2008 Columbia Basin Fish Accords Memorandum of Agreement between the Three Treaty Tribes and FCRPS Action Agencies (Accords, 2008) align with the previously noted limiting factors (Table 2). Additionally, the document links benefits based upon limiting factors for listed fish to projects funded under the agreement, of which, The Project is one. The North Fork John Day River and its tributaries between the Middle Fork John Day River up to and including Camas Creek score lower than the Upper North Fork John Day River for current and expected habitat function. This is likely due in part to more land being intensively managed for agriculture, warmer and dryer climactic conditions, and higher concentrations of human populations and their related infrastructure. Upper Camas Creek maintains some of the qualities of the Upper North Fork John Day River and its tributaries. With improved strategies to identify and implement habitat restoration actions and improved coordination amongst basin cooperators limiting factors are being addressed more effectively than in the past.

Watershed	Primary Limiting Factors	Estimated Current Function	Estimated Future Function		Estimated Current Watershed Function	Estimated Future Watershed Function	
			Estimate 10 years	Estimate 25 years		Estimate 10 years	Estimate 25 years
Mid N Fk. JD and tribs (M Fk. to and including Camas Cr.	In-channel Characteristics	40	50	60	45	56.5	68
	Passage / Entrainment	54	70	90			
	Riparian / Floodplain	40	50	60			
	Sediment	50	60	70			
	Water Quality - Temperature	50	60	70			
Upper N Fk. JD and tribs above Camas Creek	In-channel Characteristics	60	70	80	62	72	82
	Passage / Entrainment	70	80	90			
	Riparian / Floodplain	60	70	80			
	Sediment	60	70	80			
	Water Quality - Temperature	60	70	80			

Table 2. Primary limiting factors by watershed in the North Fork John Day River Basin and estimated current and future function correlated to habitat restoration. Adapted from Accords, 2008 Attachment G.

2017 ACCOMPLISHMENTS

A description of individual Work Elements locations (Figure 4) and list of efforts undertaken follows.

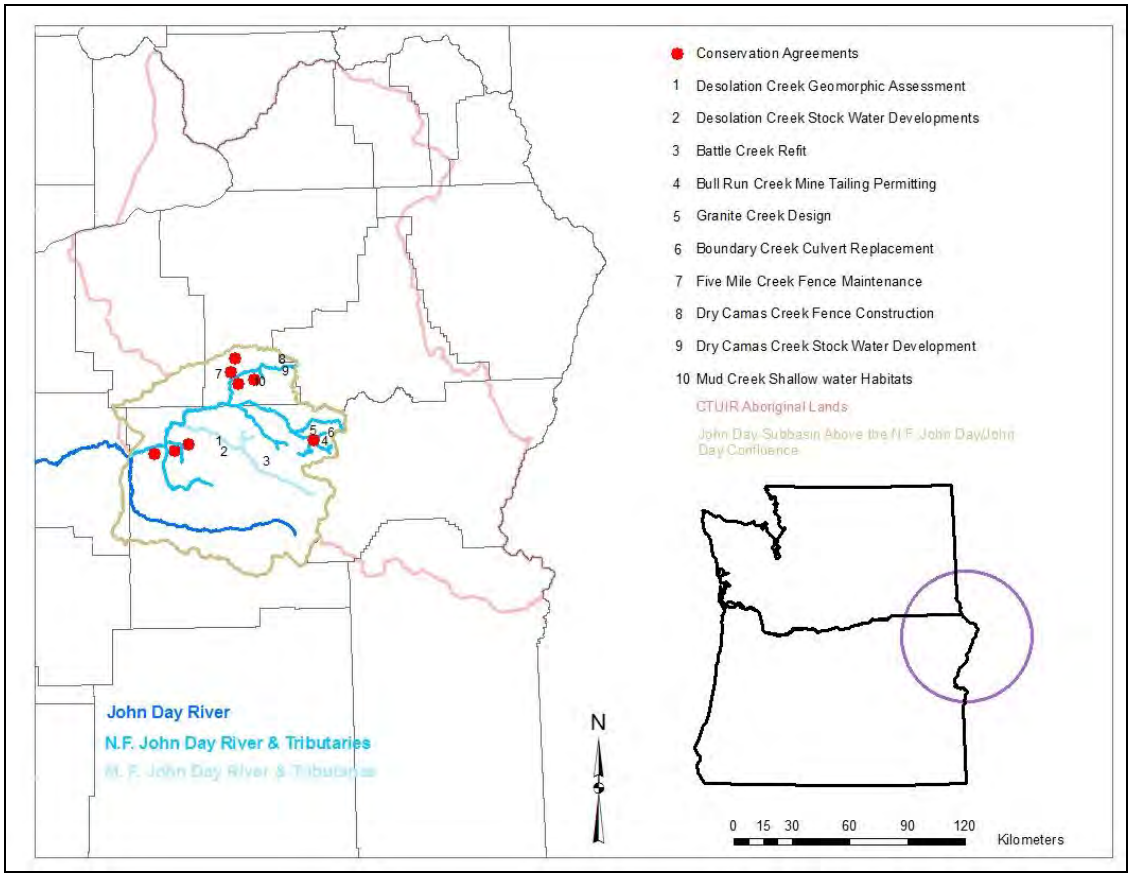


Figure 4. Restoration and Protection Site Locations.

WE A – Identify, Prioritize and Select Habitat Project Areas

Completed and submitted to BPA a draft Statement of Work for 2018. In an effort to reduce contracting delays the 2017 Statement of Work was delayed slightly while bids were secured to detail design costs for private property on Granite Creek. The 2018 Statement of Work outlined our efforts in the Camas, Desolation, and Granite Creek focal basins and continues.

WE B – Secure Conservation Agreements

No conservation agreements were entered into during 2017. The Project is currently working through restoration design and implementation efforts where agreements currently exist.

WE C - Produce Environmental Compliance Documentation

All permits and/or requisite information were secured by CTUIR or passed on to BPA.

WE D – Provide Outreach and Education
Outreach during this performance period consisted of attendance at various meetings. Ten NFJDWC meetings were attended as a board member.

In support of providing a tribal perspective staff attended three meetings developed by Oregon State Parks to address fish passage and water quality issues related Bates Pond within the Bates State Park. The existing fish ladder creates a barrier for juvenile Threatened Mid-Columbia Steelhead trout and the pond contributes to elevated water temperatures that exceed TMDL standards. As a result of these meetings a concept was identified which will be developed with additional input by those who participated in the previous meetings.

WE E – Maintain Water Developments
Water developments were maintained throughout 2017 and The Project will continue to coordinate with landowners regarding maintenance. All issues related to maintenance were resolved.

WE F – Investigate for Livestock Trespass
Trespass was addressed in one instance at the Mud Creek site. Work on the boundary fence rectified the problem.

WE G – Maintain Fences
Fence inspections throughout 2017 did not identify maintenance that wasn't repaired in short order.

WE H – Maintain Vegetation
A contract for noxious weed control efforts awarded in April of 2017 used herbicides on Granite, Mud, Desolation and Deer Creeks and the NF John Day conservation agreement sites. The CTUIR collaborated with the City of Ukiah for weed control on Lower Camas Creek site and adjacent properties within and around the city. Treatment records were submitted to BPA in fulfillment of HIP III requirements.

WE I – Granite Creek RM 7.5 Design
Work on the Granite Creek RM 7.5 design continued after rescoping the project as requested by the HIP III regional review team. The Project reached out to the Umatilla National Forest who managed land downstream of the original project site, a private landowner upstream of the project site, and another private landowner south of the project site. Of these three the Umatilla National Forest, and the landowner immediately upstream of the project site agreed to participate in the effort. The 30% Conceptual Design arrived in August of 2018 while the 80% and 100% final designs arrived in January of 2019. Unfortunately at the 80% design level the upstream landowner stepped back from the effort although given the advanced level of design the final design included treatments on their property which will only be implemented if an interest is rekindled.

The final design calls for the development of riffles and side channels and remaindering the main channel to reestablish floodplain connectivity by elevating riffle crests and lowering portions of the floodplain surface. Lowered channel gradient resulting from

riffle development is expected to increase Granite Creek's capacity for trapping and maintaining gravel sized sediment and in turn improve spawning habitat which is lacking through most of the project site. Large wood structures will be developed within the primary channel to increase channel complexity and improve spawning and rearing opportunities which are currently limited. The development of side channels, associated large wood structures, floodplain grading and native vegetative plantings will slow water velocities to improve groundwater recharge, expand the distribution and species complexity, and through natural process develop floodplain features capable of supporting active beaver populations in time.

Given the design's date of arrival relative to the performance period's end date and a need to finish implementing the Desolation Creek Upper Reach 6 design The Project has will not implement the design in 2018. We will work to line out permits and secure a qualified implementation contractor during the 2018 performance period.

WE J - Desolation Creek Geomorphic Assessment

Work on the Desolation Creek Assessment and Acton Plan (GAAP) continued collaboratively with the UNF, NFJDWC, CTWRSO, ODFW, and CTUIR through regular communication and two meetings in Ukiah, Oregon. The final assessment and action plan was received from the contractor in July of 2017 and distributed to collaborators. Implementation of the GAAP will begin with the highest Tier I priority, Reach 6 (WE M).

WE k – Desolation Creek Priority 1 Design

The Desolation Creek Upper Reach 6 Design, including RRT review, continued to its acceptance and delivery in June of 2017. A joint fill/removal permit was developed and submitted to the Oregon Department of State Lands and the Corps in early April based upon the 60% design with the intent to implement as much of the design as possible in 2017.

WE L – Desolation Creek Priority 2 Design

Work on the design for Desolation Creek's Lower Reach 6 was put on hold pending deliberation tied to relocating a U.F. Forest Service road to adjacent hillslopes. When Bonneville Power Administration agreed to complete NEPA documentation for the relocation the Umatilla National Forest provided funding for a topographic surveys and the design of two culverts in 2017. Surveys and design work spanned 2017 and 2018.

WE M – Desolation Creek Priority Implementation

The Desolation Creek Upper Reach 6 Design was received in time to implement the upper 0.25 miles of the design with available funding from the Bonneville Power Administration (Figure 5). An implementation contractor had been selected through a competitive bid process in early 2017 and placed under contract. Implementation occurred over five days at the end of the 15 July to 15 August in-stream work window. In total, one historic side channel was reconnected, one berm perforated, five large log jam structures were constructed three meander bend structures were constructed, and one three log structure was constructed (Figure 5). The side channel was full and passing flow the day following reconnection and grass seed was spread after the first fall rains. Although the design called for complete removal of the floodplain berm a decision was made to perforate the structure to prevent the loss of trees providing stream shade.

Figure 5. Upper left, May of 2018, three of the large log jam structures. Upper right, a meander bend structure before racking material has been placed. The lower left picture shows the excavation for the side channel reconnection, a perforation of the floodplain berm, and the three log cross structure.

WE N – Bull Run Creek Mine Tailing Permitting

During 2017 a Statement of Goals and Objectives was developed to guide the design effort. In June a Kick-off meeting was held where the collaborators met with the design contractor discussed concepts and treatments and data was collected by the design contractor and the CTUIR's Bio-Monitoring Project with the intent to have a final permitted design by 31 January 2018. A 15% Conceptual Design was accepted by the CTUIR in mid-August and passed to collaborators. Unfortunately, after this point opinions regarding specific treatments and concepts diverged. After considerable back and forth a meeting was held on 4 January of 2018 with the intent to identify concepts and treatments to carry to the 30% Conceptual design. The meeting ended without any consensus regarding concepts or treatments. The Project subsequently drafted three alternatives based upon the previous discussions whereby one would be selected and upon which, all future design work would be based. These alternatives and approach were accepted by the U.S.F.S. District Ranger in February of 2018.

WE O – eDNA Collection

A lack of concrete evidence related to bull and brook trout presence and absence and comments from the 2013 ISRP Evaluation which suggested that The Project needed to proactively identify and perhaps treat invasive species precipitated this WE. The latter

point is beyond The Project's scope save through efforts to address ecological concerns tied to physical and biological process and habitat. However, The Project worked with the Umatilla National Forest to build upon previous eDNA surveys and further our understanding of species distribution. During 2017 additional samples were collected using resources developed by the Rocky Mountain Research Station's Range-wide Bull Trout eDNA Project located in Missoula, Montana. This second effort intended to expand data collection in the Desolation Creek basin and also sample in the Upper North Fork John Day and Granite Creek basins. Target species for the effort included bull trout, brook trout and Pacific lamprey using markers the Rocky Mountain Research Station had in their inventory.

Sample sites were selected based upon gross breaks in watershed stream distributions and expected or unknown areas of occupancy with sampling scheduled for late August. Unfortunately, The Project's staff were unable to collect data during the scheduled period due to workload and sampling was put off until late September. Additionally, staff from the Umatilla National Forest were unavailable and only 30 of the 39 selected sites were sampled.

WE P – eDNA Analysis

Equipment for eDNA sampling and analysis were obtained from the Rocky Mountain Research Station's Range-wide Bull Trout eDNA Project located in Missoula, Montana which uses a modified protocol adapted from Goldberg et al. (2011b) for their eDNA analysis. Samples were analyzed for the presence of bull and brook trout, using eDNA markers (Wilcox et al. 2013, Wilcox et al. 2015). Each sample was analyzed with a quantitative PCR instrument in triplicate. A sample was considered positive for the presence of the target species if at least one of the three PCR reactions amplified DNA of that species. Results from the analysis are compared against markers in their inventory. Sample results are shown in Appendix 2.

Results indicated the presence of Pacific Lamprey in the Camas Creek basin at the Ukiah-Dale Forest State Park downstream of Ukiah, OR but not at the Lower Camas Creek site at Ukiah Oregon or at the Umatilla National Forest boundary near Camas Creek's RM 20. This suggests Pacific Lamprey are present in the Owens Creek basin. Unfortunately, the CTUIR has not been successful in working with private landowners, who largely own the lower basin, at a large enough scale to effectively address habitat in this area. The CTUIR will work throughout the Camas Creek basin as opportunities arise and funding opportunities allow. Additional sampling would be useful in Owens Creek if the opportunity arises.

Brook trout were identified within the North Fork of Desolation Creek above Desolation Meadows and above the north fork and south fork confluence. This is unfortunate as Desolation Meadows is a high value meadow system in need of restoration. As such, additional sampling to confirm these results would be beneficial.

Brook trout were also identified within NFJD tributaries of Lake Creek and Crane Creek. This is not surprising as upper Lake Creek contains Olive Lake which is and has been a popular fishing and recreation site so the historic stocking of brook trout is a real possibility. Their presence may become more of an issue as the Umatilla National Forest

works to address the stability of the Olive Lake Dam. The Crane Creek basin does not contain a lake that would have been stocked so we must assume by they arrived by migration as we don't have evidence of direct planting. The lower portions of both Lake and Clear Creek reside within the North Fork of the John Day Wilderness Area which makes any potential restoration more difficult. Actions have been identified in both basins although they are of lower ranking relative to other portions of the upper John Day River and its tributaries. The CTUIR will take the presence of brook trout into consideration if and when restoration actions are being planned and implemented.

Bull trout were identified within the Granite Creek basin above Little Boulder Creek. Their absence in Bull Run (tributary of Granite Creek) and Olive Creeks (tributary of Clear Creek) was not anticipated as they have been located within both basins during previous sampling efforts. It is possible that by the time samples were collected they had moved to spawning sites lower in the basin, however, spawning habitat exists between these sample sites and another collected above Granit Creek's confluence with Ten Cent Creek one mile downstream of the Granite and Clear Creek Confluence.

The Rocky Mountain Research Station's Range-wide Bull Trout eDNA Project has developed a web based mapping program where the results of all surveys are displayed which will greatly help in identifying where bull trout exist. Although there is still a need to refine the findings of previous surveys the Project will need to develop a stronger relationship with collaborators to strategically sample for both bull trout and brook trout and to ensure staff are available as promised. Perhaps the greater benefit to additional sampling is the identification of Pacific lamprey habitat and its use as they are more often noted as a species of concern when developing and justifying restoration efforts as their distribution is more expansive than that of bull trout.

WE Q – Desolation Creek Gauging Station

A pressure transducer, sounding reel, flow meter, and rigging equipment were purchased by The Project and a sounding weight was provided by the Umatilla National Forest for the development of a gauging station on lower Desolation Creek. The station was developed late in the performance period when icing prevented data collection. The gauge will improve our understanding of flows in the basin and to identify the effects of restoration actions as they are individually and cumulatively implemented.

WE R – Desolation Creek Meadow Storage Study

The Project worked with the NFJDWC to finalize piezometer locations. Unfortunately the contractor responsible for placing piezometers wasn't able to begin work until the fall rains had already begun. While the ground was dry enough to install equipment the intent was to establish a baseline by placing monitoring equipment during the water table's lowest elevation. Work was put off until 2018 because of this.

WE S – Collect Water Temperatures and Photo Point Data

Temperature loggers were deployed in June and retrieved in late September. Data was subsequently proofed and entered into the CTUIR's Central Database Management System. Photo Points were collected in September and have also been placed in the Central Database Management System.

WE T – Produce Pisces Status Reports
Submitted as required.

WE U - Submit Annual Progress Report for 2016 Performance Period
This report fulfills the CTUIR's annual reporting obligations for the 1 February 2016 to 31 January 2017 performance period.

WE V – Manage and Administer Project
All aspects of this WE were completed save attendance at TWIG Workshops. The project's other activities precluded attendance due to time constraints.

DISCUSSION

Responses to ISRP Qualifications resulting from the 2013 Geographic Review processes are contained in Appendix II.

The Project outlined an approach to monitoring accepted during the 2013 ISRP Geographic Review accepted by the ISRP. The Project would collect and analyze photo point and water temperatures data where conservation agreements exist RM&E data would be collected and analyzed by the CTUIR's Bio-Monitoring Project (BPA Project # 2009-014-00). Photo point data is collected annually in late summer and water temperatures collected from early June through late September. Water temperatures are collected using Hobo Pendant or Hobo Pro data loggers recording at one hour intervals at dedicated locations at the upstream and downstream ends of a site. The CTUIR's Bio-Monitoring Project is currently collecting pre-implementation data at the Granite Creek RM 7.5 Site (Site GCT00001) and Desolation Creek Upper Reach 6 Site (Site DesolationCreek_Control2/_Treatment2). The Bio-Monitoring Project develops annual reports from which The Project summarizes relevant information. Since data collected in 2017 is pre-implementation data, was discussed in The Project's 2017 annual report, and monitoring of the Bull Run Creek Mine Tailing Design site will begin in 2018 a summary of CTUIR's 2017 Bio-Monitoring Project's data will not be included in this report.

For this report The Project incorporated results of statistical 'F', 'Welch', and 'Wilcoxon/Kruskal-Wallis tests examining the significance of differences between raw data mean and variance at upper, middle, and lower logger locations. Results are presented as significant or not. Unfortunately, this approach does not quantify or qualify temperature' signal's qualities such as shorter term variation and lagging, buffering, and a combination of effects described by Arragoni et al (2008). In an effort to speak to the temperature signal's influence upon species of interest descriptions of data will also refer to the seven day maximum moving window average and a lethal 25^{o} Celsius threshold for Chinook salmon (McCullough, 1999) and a 19.1^{o} Celsius threshold where feeding stops for Chinook salmon (McCullough, 1999). A 10 – 15.6^{o} Celsius range preferred by juvenile Chinook salmon (McCullough, 1999) will also be used for comparison.

Lower Camas Creek

In total, 335 meters of levee were removed, five J-hooks developed, one mile of riparian fence constructed, five upland stock water ponds developed, and native plantings were placed under the Farm Services Agency's CREP Program (5000 plantings) on the Lower Camas Creek site. A second planting by the CTUIR (200 native species) occurred in 2008. These plantings weren't successful due to wildlife predation and long term inundation directly resulted in the 2015 development of 2.75 meter tall enclosures to protect 233 trees planted in 2015 from wildlife.

Photo points (Figure 6) continue to show streambank erosion and the isolation of J-hooks placed in 2006 as Camas Creek migrates over time. Without the development of large woody debris structures or similar features to encourage and maintain channel form and features such migration is expected. A larger more comprehensive restoration effort addressing sediment deposition in Camas Creek upstream of this property and stream process downstream to where Camas Creek enters a narrow bedrock controlled canyon is needed. Such an approach would more comprehensively and effectively address stream and floodplain process. Until such an opportunity arises The Project will continue to develop, design, and implement such efforts as time, funding, and opportunities allow.

Noxious weed control efforts during 2017 treated four acres of Bull thistle, Saint Johnswart, Dalmatian toadflax, and Canada thistle. Treatments have been consistent in the weeds treated and the area treated to date.

Figure 6. Photo point collected for the Camas Creek site (right) 2007 a year after levee removal looking downstream with the lowest two J-hook structures visible. During 2017 (left) looking downstream from the middle of the reach where the lowest two J-hook structures is visible

Water temperature data reflect diurnal atmospheric variations and although muted, the movement of fronts through the area on approximately one week cycles (Figure 7). Upstream and within the site Camas Creek suffers from lack of shade and oversimplified channel providing ample opportunity for thermal inputs during baseflow periods. However, it is interesting that water temperatures never exceeded 20^{o} Celsius and remained consistent throughout the sampling period. Additionally water temperatures cooled by less than 0.2^{o} Celsius save a brief period, 18 – 22 August, and warmed by less than 0.5^{o} Celsius after 7 September. An analysis of raw data's variance and mean value indicated there was no statistically significant difference between the upper and lower data logger locations during June, July, August, and September. This reinforces the regular tracking of temperature data at the upper and lower loggers more clearly represented by the seven day maximum daily temperature moving window filter (Figure 7).

During 2017 water temperatures data points fell within the preferred spring Chinook salmon 10 – 15.6^{o} Celsius temperature range 76.7% and 76.3% of the time for the upper and lower data logger locations respectively (Table 3). Water temperatures did not exceed the 19.1^{o} Celsius threshold more than 3.0% and 2.5% of the time at the upper and lower locations respectively and did not breech the 25 ^{o} Celsius lethal threshold at all. Although Camas Creek still lacks significant in-stream complexity such as that created by large wood and complex pool/riffle/run sequences extended periods of lethal water temperatures do not exist and the effects of higher temperatures are minimized by diurnal temperature variations that regularly dip into the 10 – 15.6^{o} Celsius temperature range.

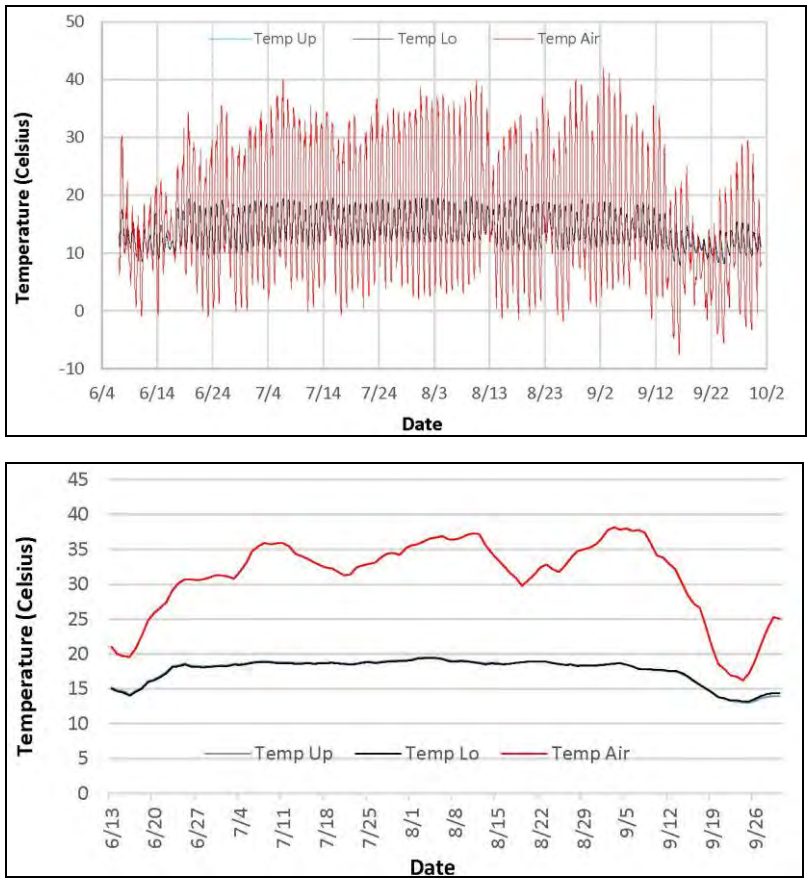


Figure 7. Data for all data collected at the Camas Creek site between 6 June 2016 and 30 September 2016 (top) and the seven day moving window daily maximum temperatures for the same period (bottom).

	Upper Data Logger		Lower Data Logger	
Temperature Range (Celsius)	**Count**	**%**	**Count**	**%**
< 10.000	135	4.8%	152	5.5%
10.000 – 15.699	2136	76.7%	2123	76.3%
15.7 - 19.099	430	15.4%	440	15.8%
>=19.1	83	3.0%	69	2.5%
SUM	2784	100%	2784	100%

Table 3. Temperature data count and percent in category tabulated for the Camas Creek site's 2017 upper and lower data loggers between 7 June and 30 September 2017.

We cannot identify a forcing element with the 2017 data although the lack of significant atmospheric forcing and regular water temperatures tracking one another suggests a third factor. In this location it is likely that groundwater forced up by a geologic knick-point approximately 1.6 Km downstream of the project site may have a significant influence upon water temperatures. It's also possible that more recently deposited sediments are influencing and perhaps enhancing the role of shallow hyporheic cycling. It would be interesting to suspend a second data logger at each location for the purpose of identifying differences in temperature within the water column.

Deer Creek

Prior to the CTUIR installing riparian fencing and stock water developments the property was used as winter pasture for cattle. As such, floodplain and riparian conditions were severely degraded. Over time riparian vegetation has recovered although the relative degree to which this occurred cannot be determined without pre-implementation data. Monitoring and evaluation data was/is not collected at the site by the CTUIR's Bio-Monitoring Project.

Both weekly atmospheric fluctuations and diurnal cycling was clearly evident in water temperature data (Figure 8). Daily maximum water temperatures at the lower logger location exceeded those of the upper location by 2° to 3° Celsius until 1 August as they had in previous years. After 1 August the difference did not exceed 1° Celsius until 19 September. This decrease coincided with a decrease in atmospheric temperatures that lasted until late August. Minimum daily diurnal temperature fluctuations remained above the preferred 10 – 15.6° Celsius range on five individual occasions and a three day period between 11-13 August. An analysis of raw data's variance and mean for June and July did in fact indicate a statistically significant difference between the signal's mean value and variance. However, it also suggested there was also a statistically significant difference between the signal's mean value and variance during August, and September. This may have been due at least in part to temperature deviations between the upper and lower logger in late September.

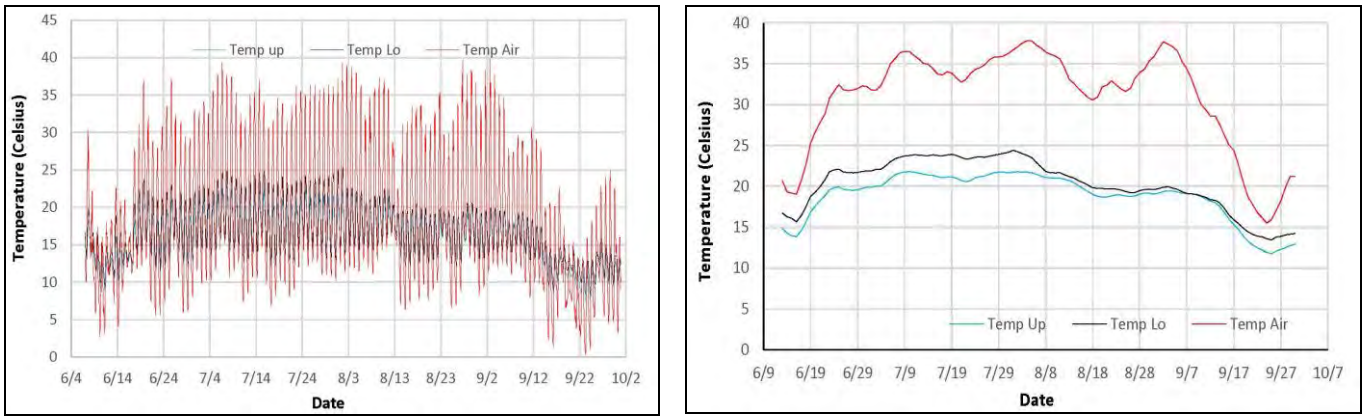


Figure 8. Data for all data collected at the Deer Creek site between 6 June 2016 and 30 September 2016 (left) and the seven day moving window daily maximum temperatures for the same period (right).

Water temperatures exceeded the 19.1° Celsius threshold for spring Chinook salmon where feeding stops 14.6% and 21.9% of the time for the upper and lower logger respectively (Table 4) and only exceeded the lethal 25° Celsius threshold on 31 July and 1 August. That said, diurnal water temperature fluctuations also fell within the 10 – 15.6° Celsius range 44.7% and 44.2% of the time at the upper and lower logger location respectively and remained below the ≥19.1° Celsius threshold 85.4% and 78.1% of the time at the upper and lower logger locations. While not ideal, temperature fluctuations outside of the preferred 10 – 15.6° Celsius range were regular and gradual enough to allow acclimation and the location of cooler water refuge by for species of interest. As such, water temperatures were not a likely cause of mortality if it did occur at all.

The water temperature's signal change is interesting not only in its behavior during 2017 but also when compared to previous years which did not show the shift. Although atmospheric temperatures cooled slightly between 2 - 17 August and in-stream water temperatures generally cooled from this point forward there wasn't clearly evident forcing by atmospheric temperatures. Hyporheic or ground water resources and stream flows haven't been monitored to date and The Project is aware of an irrigation diversion which may influence streamflows in the project site. It's possible that in-stream baseflows decreased to where the groundwater or hyporheic flows were capable of minimizing any warming trends through the site although we would have expected this decrease earlier in the sampling period. If this is the case it strongly argues for additional treatments which would reduce flow velocities and increase deposition to build groundwater and hyporehic storage and in turn buffering capacity. Second,

it is possible that nearby fields were irrigated beginning 1 August which reduced in-stream flows to where groundwater or hyporheic flows were capable of minimizing any warming trends through the site regardless of their recovery. We do not have any record of irrigation occurring and will work to develop an understanding of the temperature signal's behavior. If the second possibility did occur it still makes a case for improving the buffering capacity of ground water and hyporheic capacity.

	Upper Data Logger		Lower Data Logger	
Temperature Range (Celsius)	**Count**	**%**	**Count**	**%**
< 10.000	105	3.8%	44	1.6%
10.000 – 15.699	1244	44.7%	1231	44.2%
15.7 - 19.099	1028	36.9%	900	32.3%
>=19.1	407	14.6%	609	21.9%
SUM	2784	100%	2784	100%

Table 4. Temperature data count and percent in category tabulated for the Deer Creek site's 2017 upper and lower data loggers between 7 June and 30 September 2017.

Although native hardwood growth hasn't been quantified photo points (Figure 9) reflect their recovery since 2010 and noxious weed control efforts have been successful in reducing treated acres from over 40 acres to 20 acres in 2017. Noxious weed treatments will continue until the conservation agreement's termination in 2018.

Figure 9. Photo points for the Deer Creek site collected in 2010 (left) and 2017 (right).

Kelsay Creek

Riparian fencing was constructed in 2008 and 2009 prohibiting cattle access to stringer meadows along Kelsay Creek and nearby springs and seeps. Prior to fence construction cattle would loiter in meadows consuming grasses and sedges, cutting streambanks, and disturbing spawning and rearing habitat for Threatened Mid-Columbia steelhead trout. Building upon a previous effort downstream by the UNF the UNF and CTUIR cooperated to construct 4.4 Kilometers of 'New Zealand' fence along 1.6 Kilometers of Kelsay Creek. Monitoring for this effort included photo points and water temperature loggers. The UNF's grazing permittee completes fence maintenance with oversight by the UNF's Range Conservationist.

Photo point data (Figure 10) suggests that cattle exclusion is facilitating the recovery of native vegetation and lower levels of streambank disturbance. Elk and deer still have access to the site and likely influence hardwood vegetative recovery which may be the cause of slow hardwood growth. The

Desolation Creek GAAP (WE J) contains an element of meadow restoration which will increase flow residence time, floodplain connectivity, and native hardwood presence. Meadow restoration was identified as a priority action by the UNF during the Desolation Creek GAAAP's development. Although designs haven't yet been developed expected treatments will include the placement of large woody debris to reduce channel volume and native vegetation plantings. These treatments should have a significant affect upon ecological concerns once implemented.

Figure 10. Photo points from 2008 (left) and 2017 (right) collected at the downstream end of the Kelsay Creek site.

Weekly and daily atmospheric temperature variations were evident in water temperature signal although les evident from mid-July to early-August. Raw data suggested streamflows entering the project site were warmed by flows through approximately 5.75 Km of Kelsey Creek above the site grazed by cattle. However, once within the protected site water temperatures decreased throughout. Water temperatures between the upper and middle data loggers deviated shortly after logger deployment. The middle and lower data loggers tracked closely until the beginning of baseflow in early to mid-July. Figure 11 more clearly shows this in data analyzed using a seven day moving window filter evaluating maximum daily temperatures.

Given these trends data were analyzed between the upper and lower data loggers, upper and middle data loggers, and middle and lower data loggers to develop an understanding of the raw data's variance and mean value. The results (Table 5) reinforced our initial thoughts whereby a statistically significant difference between the upper and lower data loggers existed for mean temperature and variance in June, July, and August. In September the statistically significant difference in variance was expected although the similarity of means temperatures is interesting. Differences in mean value and sample variance were generally statistically significant between the upper and middle data logger and supported cooling in the upper half of the project site. A lack of significance may be due to the similarity of temperatures prior to later June. Analysis of the middle and lower temperature signals suggests a slightly more complex relationship where mean temperatures weren't statistically significant during June and much of July. However as baseflows decreased the difference between the two signals mean value became statistically significant. The seven day moving window average using maximum daily temperatures (Figure 11) clearly portrays these qualities of the temperature signal.

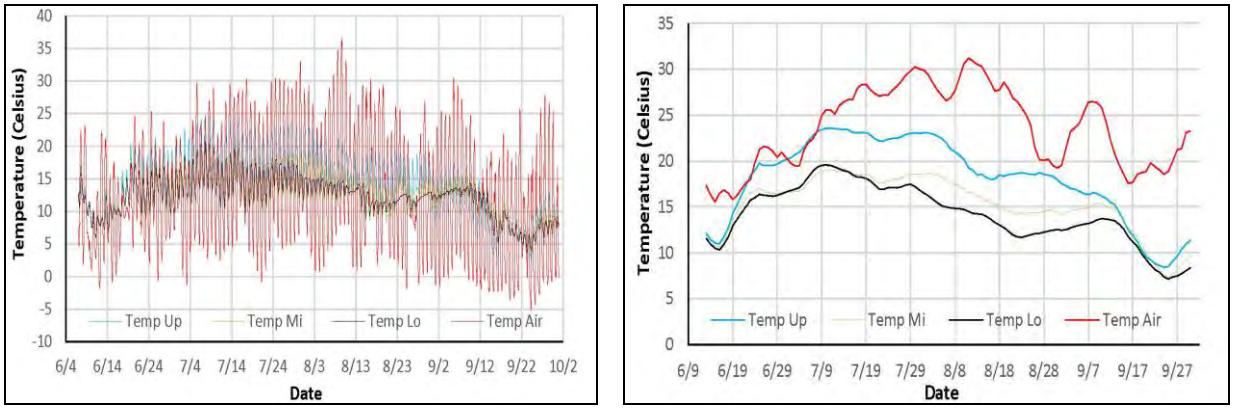


Figure 11. Data for all data collected at the Kelsay Creek site between 7 June 2017 and 31 September 2017 (left) and the seven day moving window daily maximum temperatures for the same period (right).

	June	July	August	September
Upper/Lower Kelsay Creek Loggers				
Variance	+	+	+	+
Mean	+	+	+	-
Upper/ Middle Kelsay Creek Loggers				
Variance	+	+	+	+
Mean	-	+	+	+
Middle/Lower Kelsay Creek Loggers				
Variance	+	+	+	+
Mean	-	-	+	+

Table 5. Results of statistical 'F', 'Welch', and 'Wilcoxon/Kruskal-Wallis tests examining the significance of differences between data mean and variance between the Kelsay Creek's upper and lower, upper and middle, and middle and lower data loggers. In this table '+' represents a statistically significant difference exists while a '-' suggests there is not a statistically significant difference.

A comparison of binned water temperature data (Table 6) also supports a cooling trend through the project site. Data points within temperature ranges for an individual sampling location indicate data points progressively concentrate in the 10 – 15.6° Celsius range preferred by juvenile Chinook salmon. The percentage of data points increased by 11.9% as flows moved toward the middle data logger and another 5% between the middle and lower data loggers. The greatest decrease in data points between sampling locations occurred between the upper and middle data loggers with a change of 9.7% for the ≥19.1° Celsius range. The only increase outside of the 10 – 15.6° Celsius range occurred between the middle and lower logger locations with a 0.6% increase in the greater than or equal to ≥19.1° Celsius range. This was likely due to a brief period in early July where water temperatures at the lower logger location were slightly higher than those and the middle location.

The most likely culprit of these effects given that atmospheric trends generally increase through early-September while water temperatures decrease is site improvement through natural process and/or the role of groundwater and/or hyporheic flows. Cooling between the upper and middle loggers may be due to the recovery of native vegetation and decreased compaction from cattle. It may also be a response to uninterrupted flow from nearby springs providing cool water inputs to Kelsay Creek. The lower data logger is located downstream of a geologic constriction of the broader meadow in which the upper and middle data loggers reside. As such, the possibility of upwelling groundwater and/or deeper hyporheic flows which would have a cooling effect upon stream flows exists. A second possibility in the site's lower portions, although less likely, is reduced solar input due to the valley constriction. Given the site's gently

topography we don't think would be substantial enough to force such an affect.

	Up		Middle		Lo	
Temperature Range (Celsius)	**Count**	**%**	**Count**	**%**	**Count**	**%**
< 10.000	632	22.7%	625	22.4%	592	21.3%
10.000 – 15.699	1357	48.7%	1687	60.6%	1826	65.6%
15.7 - 19.099	503	18.1%	451	16.2%	328	11.8%
>=19.1	292	10.5%	21	0.8%	38	1.4%
SUM	2784	100%	2784	100%	2784	100%

Table 6. Temperature data count and percent in category tabulated for the Kelsay Creek site's 2017 upper, middle, and lower data loggers between 7 June and 30 September 2017.

Granite Creek

During 2013 four large wood structures were developed to protect an existing trailer pad located atop placer mine tailings and create low and high flow channel margin habitat. Thus far the structures have maintained their stability and native vegetation is recovering. Planted willow cuttings can be seen in the 2017 photo point (Figure 12) and the opposing gravel bar contains more vegetation. The large wood structure visible in Figure 12 has deepened the scour hole that was present before its installation.

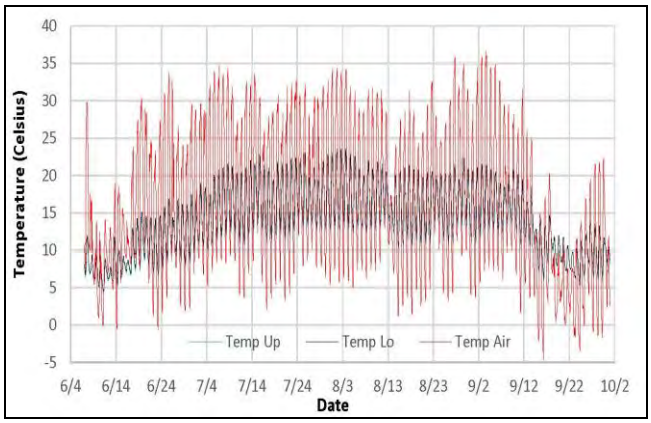
Habitats not treated during 2013 remain in a similar state as they were although two of the four pools have changed. The width of one has narrowed with depth maintained and the second is gradually being filled with gravel sized sediments through natural process. The 2017 performance period's WE I speaks to a second effort, under which, ecological concerns related to floodplain connectivity and complexity and stream channel form and complexity will be addressed. Treatments identified in WE I will complement past efforts without disturbing them. The design will increase floodplain connectivity by resetting Granite Creek's grade, development of side channels, and floodplain grading, increase channel complexity through the development meander bends and riffles thereby resetting grade, increasing pool/riffle/run sequences, and large woody debris placement, and increasing floodplain complexity through floodplain grading, side channel development, and native vegetative plantings.

Figure 12. Photo points collected at the Granite Creek site during 2013 (left) and 2017 (right).

Water temperature data indicates Granite Creek is readily reactive to diurnal changes in atmospheric temperatures, the movement of weather fronts on a slightly longer time scale, and seasonal temperature shifts (Figure 13). Flows warmed through the site although differences in maximum daily water temperatures were less than 0.62^{o} Celsius while daily minimum water temperatures did not exceed 0.87^{o} Celsius. The greatest difference occurred between late June and early July although it persisted throughout the sampling period. While these differences appear small, analysis determined

there was a statistically significant difference in mean temperatures between the upper and lower data logger sites for June, July, August, and September although a statistically significant difference could not be identified for variance. The behavior was more visible when a seven day moving window filter was applied to daily maximum temperatures (Figure 13).

The distribution of data points within selected temperature ranges (Table 7) indicate a warming trend through the site as the number of data points in the 15.7° – 19.099° Celsius range and ≥19.1° Celsius ranges increased by 2.2% and 2.6% respectively. Fortunately, the 10 – 15.6° Celsius range preferred by juvenile Chinook salmon contained 47.2% and 44.1% of the data points at the upper and lower data logger locations respectively while the ≥19.1° Celsius range contained only 11.4% and 14.0% of the total data points. This suggests that while water temperatures exceed the point at which feeding stops water temperatures were within the preferred range on a daily basis which would have minimized mortality due to excessive temperatures. It will be interesting to track changes in temperature as floodplain and stream channel complexity are influenced as the WE I design is implemented. We expect to see changes in signal amplitude and perhaps a decrease in mean temperatures.



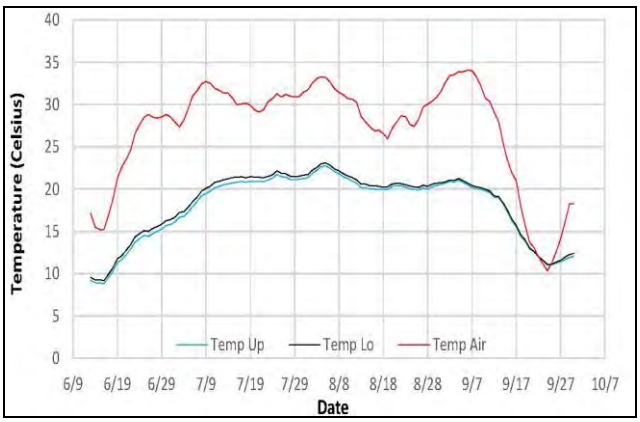


Figure 13. Data for all data collected at the Granite Creek site between 7 June 2017 and 31 September 2017 (left) and the seven day moving window daily maximum temperatures for the same period (right).

	Upper Data Logger		Lower Data Logger	
Temperature Range (Celsius)	**Count**	**%**	**Count**	**%**
< 10.000	608	21.8%	561	20.2%
10.000 – 15.699	1314	47.2%	1227	44.1%
15.7 - 19.099	544	19.5%	605	21.7%
>=19.1	318	11.4%	391	14.0%
SUM	2784	100%	2784	100%

Table 7. Temperature data count and percent in category tabulated for the Granite Creek site's 2017 upper and lower data loggers between 7 June and 30 September 2017.

REFERENCES

Accords, 2008, 2008 Columbia Basin Fish Accords Memorandum of Agreement between the Three Treaty Tribes and FCRPS Action Agencies

Arrigoni, A.S., Poole, G.C., Mertes, L.A., O'Daniel, S.J., Woessner, W.W., and Thomas, S.A., 2008, Buffered, Lagged, or Cooled? Disentangling Hyporheic Influences on Temperature Cycles in Stream Channels, Water Resources Research, 449W09418)

Carmichael, R.W., 2006, DRAFT Recovery Plan for Oregon's Middle Columbia River Steelhead Progress Report, Oregon Department of Fish and Wildlife.

Columbia BM RC&DA (Columbia-Blue Mountain Resource Conservation & Development Area). March 15, 2005. John Day Subbasin Revised Draft Plan. Prepared for Northwest Power and Conservation Council.

CRITFC (Columbia River Inter-Tribal Fish Commission). 1995. Wy-Kan-Ush-Mi-Wa- Kish-Wit Spirit of the Salmon. Columbia River Anadromous Fish Plan of the Nez Perce, Umatilla, Warm Springs and Yakima Tribes. Portland, Oregon.

CTUIR (Confederated Tribes of the Umatilla Indian Reservation), 2016, Fish Habitat Enhancement Biological Effectiveness Monitoring 2016 Annual Progress Report, CTUIR Biomonitoring Project (Bonneville Power Administration Project # 2009-014-00).

Goldberg, C. S., D. S. Pilliod, R. S. Arkle, and L. P. Waits. 2011b. Molecular detection of vertebrates in stream water: A demonstration using Rocky Mountain tailed frogs and Idaho giant salamanders. PLoS ONE 6:e22746.

ICBEMP (Interior Columbia Basin Ecosystem Management Project), 2000, Final Environmental Impact Statement, Department of Agriculture Forest Service and the United States Department of Interior Bureau of Land Management.

Jones, K. L., G. C. Poole, E. J. Quaempts, S. O'Daniel, T. Beechie, 2008. Umatilla River Vision. Prepared for the Confederated Tribes of the Umatilla Indian Reservation, 31 pp. http://www.umatilla.nsn.us/DNRUmatillaRiverVision.pdf

McCullough, D. A. 1999. A Review and Synthesis of Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids with Special Reference to Chinook Salmon, U. S. Environmental Agency, Seattle WA, Document #910-R-99-010.

Narum, S. L., Schultz, T. L., Van Doornik, D. M., and Teel, D., 2008, Localized Genetic Structure Persists in Wild Populations of Chinook Salmon in the John Day River Despite Gene Flow from Outside Sources, Transactions of the American Fisheries Society 137:1650–1656.

NMFS, 2008. Conservation and Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River Steelhead Distinct Population Segment. National Marine Fisheries Service (NMFS) Northwest Region.

NPPC, 2005. Revised draft John Day Subbasin Plan. Prepared by Columbia-Blue Mountain Resource Conservation And Development Area, Available from: http://www.nwcouncil.org/fw/subbasinplanning/johnday/plan.

USFS, 2008. Watershed Action Plan to remove barriers and improve stream function on National Forest System Lands within the Granite Creek Watershed. September 22, 2008.

USFS, 2012. FY 2012 Watershed Restoration Action Plan, Bull Run Creek Watershed; HUC 170702020202 September 24, 2012

USFWS, 2002. Chapter 9, John Day River Recovery Unit, Oregon. 82 p. In: U.S. Fish and Wildlife Service, Bull Trout (Salvelinus confluentus) Draft Recovery Plan, Portland, Oregon.

Wilcox, T. M., K. J. Carim, K. S. McKelvey, M. K. Young, and M. K. Schwartz. 2015. The dual challenges of generality and specificity when developing environmental DNA Markers for species and subspecies of Oncorhynchus. PLoS ONE 10:e0142008.

Wilcox, T. M., K. S. McKelvey, M. K. Young, S. F. Jane, W. H. Lowe, A. R. Whiteley, and M. K. Schwartz. 2013. Robust Detection of Rare Species Using Environmental DNA: The Importance of Primer Specificity. PLoS ONE 8:e59520.

APPENDIX I

Limiting Factors	Code	Objectives	Code
Channel Characteristics	CC	Improve stream channel complexity and morphology	1
Habitat Diversity	HD	Preserve desirable or improve degraded aquatic habitat	2
Floodplain Confinement	FC	Improve floodplain connectivity	3
Riparian & Floodplain	RF	Improve riparian and floodplain complexity	4
Water Quality (non-sediment)	WNS	Improve or preserve temperatures and chemistry	5
Water Quality (sediment)	WS	Improve sediment routing and sorting	6
Stream Discharge	SD	Improve streamflow during base flow periods	7
Passage Barriers/Entrainment	P	Improve passage to existing high quality habitats	8
Species Presence/Absence	SP	Support Species of Interist	9

Site	Limit. Fact.	Obj.	Year Implem.	Years Treat.	Stream Km. Affected	Acres Leased / Affected	Cntl. Site Id'd.	Metrics	Phys. Monitoring	Bio. Monitoring
Owens Creek Conservation Agreement 2001-16	CC, HD, WS, WNS	1, 2, 7	2001	15	0.5	5.2	no	- 481 meters of 4-strand barbed wire riparian fence constructed. - One stock well developed and with associated troughs. - Structure maintenance and noxious weed treatments for life of agreement.	2 cross sections 1 photo point	none
Upper Snipe Creek Conservation Agreement 2001-16	CC, HD, RF, WNS, WS	1, 2, 3, 4, 5, 6	2001	15	1.3	34	no	- 2,218 meters of 4-strand barbed wire riparian fence constructed. - Two spring developments constructed. - Structure maintenance for the life of the agreement.	2 cross sections 2 longitudinal profiles 1 photo point	2 cross sections
Lower Snipe Creek Conservation Agreement 2001-16	CC, HD, RF, WNS, WS	1, 2, 3, 4, 5, 6	2001	15	1.3	54	no	- 4,237 meters 4-strand barbed wire riparian fence constructed. - Three stock wells developed. - 7,000 native hardwoods planted. - Structure maintenance and noxious weed treatments for life of agreement.	2 cross sections 2 longitudinal profiles 2 thermistors 1 photo point	2 cross sections - vegetative survival count
Deer Creek Conservation Agreement 2003-18	CC, HD, RF, WNS, WS	1, 2, 3, 4, 5, 6	2003	13	3.8	219	no	- 2,736 meters of 4-strand barbed wire fence constructed and 2,889 meters of fence refurbished. - 11 spring developments constructed. - Approximately 7,500 native hardwoods planted. - Structure maintenance and noxious weed treatments for life of agreement.	2 cross sections 2 longitudinal profiles 2 thermistors 1 photo point	2 cross sections
Lower Camas Creek Conservation Agreement 2006-2021	CC, HD, FC, RF, WNS, WS	1, 2, 3, 4, 5, 6	2006	10	1.6	40	no	- 335 meters of levee removed - 1.6 Km of riparian fence constructed - Three stock water ponds constructed - One stock water pond improved - One spring developments created - Approximately 5,500 native hardwoods planted - Structure maintenance and noxious weed treatments for life of agreement	3 cross sections 1 longitudinal profile 2 thermistors 3 pebble count sites 1 photo point	Three cross sections
Upper Camas Creek Conservation Agreement	CC, HD, FC, RF, WNS, WS	1, 2, 3, 4, 5, 6	2009	3	1.3	256	no	- 2,450 meters of 4-strand barbed wire riparian fence and 3 water gaps constructed. - 3,090 meters of upland 4-strand barbed wire fence constructed. - One upland well developed. - Structure maintenance and noxious weed treatments for life of agreement.	12 cross-sections 1 longitudinal profile 2 thermistors	3 cross sections

Site	Limit. Fact.	Obj.	Year Implem.	Years Treat.	Stream Km. Affected	Acres Leased / Affected	Cntl. Site Id'd.	Metrics	Phys. Monitoring	Bio. Monitoring
NFJD Conservation Agreement	RF, WS	3, 6	2005	10	1.6	6.0	no	- 1.6 Kilometers of four strand barbed wire fence constructed to remove cattle from riparian areas. - One well installed to replace watering them the NFJD. - 250 native vegetative plantings	Photo points	none
NFJD Wilderness Survey 2010	HD	2	2010	1	0	0	no	- Surveyed of noxious weeds along 217 Kilometers of trail within the NFJD Wilderness area.	none	none
Battle Creek Culvert Replacement	WS, P	6, 8	2010	2	13.7	0	no	- Removed complete barrier to high quality summer steelhead trout habitat.	UNF road inspections	Spawner surveys for 2 years following replacement by the NFJD Project
Granite Creek Culvert Replacement	WS, P	6, 8	2010	1	4.3	0	no	- Removed partial barrier to high quality summer steelhead trout habitat.	UNF road inspections	Spawner surveys for 2 years following replacement by the NFJD Project
Bruin Creek Culvert Replacement	WS, P	6, 8	2011	1	8.5	0	no	- Removed partial barrier to high quality summer steelhead trout habitat.	UNF road inspections	Spawner surveys for 2 years following replacement by the NFJD Project
Beaver Creek Reconnect	P	8	2010	2	0.18	1	no	- Removed 5 log drops, sealed the stream channel with bentonite, and reshaped the stream channel.	3 cross sections 1 longitudinal profile	ODFW annual spring spawner surveys
Ten Cent Creek Culvert Replacements	WS, P	6, 8	2011	1	9.6	0	no	- Removed partial barrier to high quality summer steelhead trout habitat.	UNF PIBO & road inspections	Spawner surveys for 2 years following replacement by the NFJD Project
Clear Creek Mine Tailing Redistribution	HD, RF, RF, FC, WS	2, 3, 4, 5	2006	2	3.8	45	no	- Recontoured approximately 276,000 cubic meters of mine tailings. - Reestablished an inset floodplain to promote floodplain connectivity and sediment / debris deposition.	none	none
Kelsay Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2008	2	1.6	100	no	- 4,425 meters 'New Zealand' and one water gap along constructed.	4 photo points 2 thermistors USFS permttiee maintenance	none
Taylor Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2010	1	1.6	46	no	- 3,200 meters of 4-strand barbed wire fence constructed.	Photo point USFS permttiee maintenance	none
Sugarbowl Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2010	1	0.8	18	no	- 1,600 meters of 4-strand barbed wire fence constructed.	Photo point USFS permttiee maintenance	none
Morsay Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2010	1	3.2	100	no	- 11,747 meters of 4-strand barbed wire fence constructed.	Photo point USFS permttiee maintenance	none
Bruin Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2010	1	0.8	19	no	- 695 meters of three strand 'New Zealand' fence constructed.	Photo point USFS permttiee maintenance	none
Butcherknife Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2012	1	1.5	1200	no	- 3,621 meters of four strand barbed wire fence constructed.	UNF PIBO	none

Site	Limit. Fact.	Obj.	Year Implem.	Years Treat.	Stream Km. Affected	Acres Leased / Affected	Cntl. Site Id'd.	Metrics	Phys. Monitoring	Bio. Monitoring
Five Mile Creek Fence Maintenance	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2012	1	2.5	90	no	- Heavy maintenance on 8 Kilometers of riparian exclusion fencing.	Photo point USFS permttiee maintenance	none
Fox Creek Leafy Spurge Control	HD, RF	2, 3	2010	3	65	260	no	- Approximately 215 acres treated with herbicide and biological controls. - 45 acres survey for infestations and tracking the progress of previous treatment.	none	visual surveys of selected areas 2 transects
Granite Creek Native Vegetation Plantings	HD, RF	2, 3	2010	1	0	24.5	no	- Planted 8,400 native hardwoods in floodplain and riparian areas.	none	visual surveys of selected areas
Clear Creek Native Vegetation Plantings	HD, RF	2, 3	2010	1	2	4	no	- Planted 5,040 native hardwoods in floodplain and riparian areas.	none	visual surveys of selected areas
Granite Creek Noxious Weed Control	HD, RF	2, 3	2010	1	4.8	40	no	- 40 acres of riparian and floodplain habitats surveyed for noxious weeds. - 28.5 acres of riparian and floodplain areas treated with herbicides	none	visual surveys of selected areas
NFJD River Push-up Dam Removal and Water Right Certification	WS	6	2009	1	0.15	80	no	- One irrigation point of diversion moved approximately 152 meters to a permanent scour hole. - One water gap removed. - Water right POD change completed.	4 cross sections 4 pebble counts	Greenline survey
Fox Creek Channel Enhancement & Fencing	CC, HD, RF, WNS	1, 2, 3, 5	2013	2	0.6	8	no	- Placed 25 pieces of large wood in the original stream channel. - 20 plugs restricting flow through 700 meters of the Corps channel. - 600 meters of riparian fence constructed	Photo point	none
Lower Camas Creek Coordination	CC, HD, RF, FC, WNS, WS, SD	1, 2, 3, 4, 5, 6, 7	2013	2	9	1,000	no	- Completed brief detailing past and existing conditions, possible influences of existing geomorphology, and a strategy for developing appropriate treatments.	nothing established to date beyond cross-sections and pebble count data collected as baseline information	none
Corrigal Springs Culvert Replacement	WS, P	6, 8	2013	1	5.8	0	no	- Removed partial barrier to high quality summer steelhead and bull trout habitat.	UNF road inspections	Spawner surveys for 2 years following replacement by the NFJD Project
Mud Creek Conservation Agreement 2013-27	CC, HD, RF	1, 2, 3	2013	2	1.6	100	no	- 2,407 meters of six strand high tension wire fence constructed. - One water gap installed - One stock water well developed with associated solar pump, panels, and water trough.	Photo points	none
Red Boy Pipeline Replacement & Signs	WS	6	2013	1	0.25	0.5	no	- Six inch PVC drain pipe between the mine audit and settling ponds was replaced with 250 meters of 12" HDPE pipe and the number of cleanouts increased from two cleanouts to five manholes and two cleanouts. - 2 information signs developed and installed	Pipeline and settling pond maintenance by landowner	none
Taylor Creek Fence Maintenance	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2013	1	1.6	10	no	- Heavy maintenance completed on 1.6 Kilometers of riparian fence constructed in the 1980s.	Photo points USFS permttiee maintenance	none

Site	Limit. Fact.	Obj.	Year Implem.	Years Treated	Stream Km Affected	Acres Leased / Affected	Cntl Site Id'd.	Metrics	Phys. Monitoring	Bio. Monitoring
Little Indian Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2013	1	1.0	25	no	- 2,103 meters of four strand barbed wire fence constructed.	Photo points USFS permttiee maintenance	none
Smith Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2013	1	4.0	90	no	- 1,219 meters of four stand barbed wire fence constructed.	Photo points USFS permttiee maintenance	none
Granite Creek Conservation Agreement 2013-23	CC, HD, RF, FC, WNS, WS	1, 2, 3, 4, 5, 6	2013	2	0.6	10	yes	- Four large wood structures and one rock weir installed to reduce sediment entrainment in Granite Creek.	CTUIR Bio-Monitoring Project	CTUIR Bio-Monitoring Project
CTUIR Monitoring Plan Development	CC, HD, RF, FC, WNS, WS, SD, P	1, 2, 3, 4, 5, 6, 7, 8	2013	0	0	0	no	- Developed a reached scale monitoring plan to standardize the CTUIR's Fishery Habitat Program's monitoring efforts.	none	none
Deep Creek Culvert Replacement	WS, P	6, 8	2014	1	3.2	1	no	- Removed partial barrier to high quality summer steelhead and bull trout habitat.	UNF road inspections	Spawner surveys for 2 years following replacement by the NFJD Project
Bull Run Creek Culvert Replacement	WS, P	6, 8	2014	1	16.2	0	no	- Removed partial barrier to high quality summer steelhead and bull trout habitat.	UNF road inspections	Spawner surveys for 2 years following replacement by the NFJD Project
Little Indian Creek Culvert Removal	WS, P	6, 8	2014	1	0.5	0	no	- Removed partial barrier to high quality summer steelhead trout habitat.	photo points	Spawner surveys for 2 years following replacement by the NFJD Project
Camas Creek Fence Maintenance	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2014	1	35	230	no	- Heavy maintenance of riparian fence constructed in the 1980/90s protecting 35 Kilometers of stream channel and floodplain habitats	UNF PIBO USFS permttiee maintenance	none
Camas Creek Geomorphic Assessment and Action Plan	CC, HD, RF, FC, WNS, WS, SD, P	1, 2, 3, 4, 5, 6, 7, 8	2015	1	9	1000	no	- Geomorphic Assessment concentrating on the primary assessment area extending from river mile 12.0 to 17.8 A secondary assessment area included all portions of the watershed above river mile 17.8.	LiDAR River Form Metrics 1D & 2D Hydrologic Modeling Aerial Photographs	none
Desolation Creek Fence Maintenance	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2015	1	18.9	33.7	no	- Heavy maintenance on 39 Kilometers of riparian fence constructed in the 1980/90s protecting 18.7 Kilometers of stream channel and floodplain habitats	USFS permttiee maintenance	none
Desolation Creek Stock Water Developments	CC, RF, WS	1, 2, 3, 6	2015/16	2	0.0	1.0	no	- One spring developed to include spring box, trough, and spring fenced off	none	none
Fox Creek Riparian Fence	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2015	1	0.8	1.7	no	- 800 meters of four strand barbed wire fence constructed to protect summer steelhead trout habitat from cattle.	None Landowner maintenance	none

Site	Limit. Fact.	Obj.	Year Implem	Years Treat	Stream Km Affected	Acres Leased / Affected	Cntl Site Id'd.	Metrics	Phys. Monitoring	Bio. Monitoring
Battle Creek Refit	WS, P	6, 8	2016	1	13.7	0	no	- Restored passage through the baggier through washing in fine material and creation of an inset low flow channel	none	none
Five Mile Creek Fence Maintenance	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2016	1	9.6	2693	no	- 26.5 Km of fence received heavy or general maintenance	UNF PIBO USFS permttiee maintenance	none
Camas Creek Fence and Stock Water Developments	CC, HD, RF, WNS, WS	1, 2, 3, 5, 6	2016	1	8	1	no	- 1.2 Km of four strand barbed wire fence constructed	none	none
								- one stock water pond created and one existing stock water pond deepened	Permttie and landownere maintenance	none
Desolation Creek Geomorphic Assessment and Action Plan (GAAP)	CC, HD, RF, FC, WNS, WS, SD, P	1, 2, 3, 4, 5, 6, 7, 8	2015/17	3	11	135	no	- Geomorphic assessment concentrating on the primary assessment area extending from river mile 1.2 to 11.8 with the balance of the basin considered the secondary assessment area - Desolation Creek basin wide Action Plan to guide restoration efforts	LiDAR River Form Metrics 1D Hydrologic Modeling	none
Desolation Creek Upper Reach 6 Design	CC, HD, RF, FC, WS	1, 2, 3, 4, 5	2016/17	0	0.4	15	yes	- Developed a design for the highest priority identified in the GAAP	CTUIR Bio-Monitoring Project	CTUIR Bio-Monitoring Project
Desolation Creek Upper Reach 6 Implementation	CC, HD, RF, RFC, WS	1, 2, 3, 4, 5	2017	1	0.4	6	yes	- One side Channel reconnected - One berm perforated - Nine LWD structures constructed	CTUIR Bio-Monitoring Project	CTUIR Bio-Monitoring Project
Bull Run Creek Mine Tailing Design	CC, HD, RF, FC, WNS, WS	1, 2, 3, 4, 5, 6, 7	2017	1	3.2	40	yes	- Developed a design for a priority action identified in the Bull Run Creek Action Plan	LiDAR River Form Metrics Surface Water Levels	CTUIR Bio-Monitoring Project
eDNA Collection	SP	9	2017	1	65	0	no	- Collected eDNA for Pacific lamprey, bull trout, and brook trout	none	eDNA
Desolation Creek Gauging Station	SD	7	2017	1	400	0	No	- Established a stream gauging station on Lower Desolation Creek	Stream Gauge	none
Desolation Creek Storage Feasibility	SD	7	2017	1	0	43	No	- Worked with the NFJDWC to support their establishment of six piezometers	Piezometers	Soil Samples

APPENDIX II

ISRP Qualification - Lessons Learned: The proponent is requested to provide a more comprehensive summary of lessons learned. This documentation should be provided in annual project reports to BPA.

For 2017 the lesson learned fell upon the eDNA sampling and the Bull Run Creek Mine Tailing Design. The eDNA collection and analysis effort arose through one on one communication between the Umatilla National Forest South Zone Biologist and The Project. As there was no funding changing hands and an expectation of shared labor for field sampling an agreement between the two entities wasn't secured. In hindsight this was a mistake that will be rectified in the future with full participation of both parties or no work will be completed.

With regard to the Bull Run Creek Mine Tailing Design, The Project developed a Statement of Goals and Objectives to guide the collaborator's efforts in the development and implementation of a suitable design to address ecological factors of concern. Unfortunately, several treatments and concepts advocated by collaborators weren't defensible under the CTUIR's First Foods Policy and Umatilla River Vision. This and an unwillingness to compromise produced the impasse which could not be surmounted at the final meeting of the 2017 performance period (4 January 2018). Because of the impasse and the subsequent development of design alternatives The Project included the identification of alternatives and selection of a preferred alternative at the 15% Conceptual Design level for the 2018 Desolation Creek Reach 3 Design effort and will do so for all future design efforts.

ISRP Qualification - Roles and Responsibilities: Given the scope and complexity of the NFJD project, additional emphasis on coordination is likely to reduce project costs and to make the best use of the wide array of skills available to the project—both within the subbasin and from the region. It would be particularly useful to have a written, initial framework that identifies broad roles and responsibilities among key partners and players. It could start by addressing the CTUIR organization, with a focus on Natural Resources, and then progress through discussions/agreements with key partners. These discussions should be useful for the long term success of the project. Documentation does not need to be detailed but should be sufficient to capture major agreements and responsibilities among participants. It should be included in the next annual progress report to BPA.

<u>CTUIR</u>
See previous descriptions.

<u>NFJD Basin</u>
Over the past several years the John Day Partnership has been evolving from a loose group to a well-defined and supported entity capable of submitting successful applications for funding support of its membership. The partnership previously received capacity funding from the Oregon Watershed Enhancement Board's Focused Investment Partnership to develop an Operation Manual, develop and secure Memorandum of Understanding from collaborators participating in the Partnership, and developed an Action Plan for the John Day basin. The Partnership consists of a steering committee responsible for high level guidance of the general partnership, three subbasin groups representing the lower mainstream, upper mainstream, and north and middle fork regions, a technical committee, an outreach committee, and a financial committee. The CTUIR has actively participated in all committees.

In 2017 the Partnership continued development of internal structure and the collection of existing data into a central database and evaluated potential tools to be used in the development of a John Day basin Action plan. In the end the Bonneville Power Administration's ATLAS prioritization framework was selected. This in part due to Bonneville Power Administration's presence and the capacity of its John Day basin proponents. Incorporation of ATLAS's also complemented previous and ongoing prioritization efforts by basin collaborators using the ATLAS framework.

Region

The Project's role and responsibilities at the regional level has been largely discussed in previous annual progress reports. However, the John Day Partnership's development required coordination with the CTUIR's higher echelons such as management staff within the Department of Natural Resources, the CTUIR's Fish and Wildlife Committee, and executive director level staff. Their interactions with The Project and the John Day Partnership are reflected in coordination with CTUIR staff and that of other organizations as the role of the CTUIR and funding for future actions is developed.

ISRP Qualification - Data Management: The primary concern is how data will be managed during the 2-3 years while development of the CTUIR data management system is being completed. Additionally, it does not appear that there are contingency plans to deal with possible delays in full implementation of the data management system. Does the completion of the data management system by 2018 mean that temporal analyses cannot occur before then? Is there a priority list for bringing modules on line? These are important concerns from the perspective of program effectiveness. A written response to these concerns should be included as part of the project's next annual report to BPA.

Development of the CTUIR's Central Data Management System (CMDS) continued through 2017. By the end of 2017 the Monitoring and Evaluation module save the CHaMPS and AEM components, Operations and Maintenance, and Water Temperature and Water Quality datasets had been developed and were being populated.

The CMDS consists of a Project Tracker component established to store information related to an actions goals, objectives, ties to First Foods, Umatilla River Vision, limiting factors, ecological concerns, dates, and ancillary documentation. From this information progress reports for CTUIR use can be developed to inform CTUIR managers, policy, and tribal government. The Project began populating the Project Tracker in 2017. However, internal guidance with regard how data was to be organized differed from The Project's approach. As such, data entry was put on hold until the recommended changes were made in 2018.